Fact Sheet

LOW-TEMPERATURE HOT WATER HEAT DISTRIBUTION SYSTEMS

PROBLEM

Currently, most DoD facilities are heated with central heat distribution systems that use either high-temperature water or steam to convey the heat. Approximately 6,000 miles of these systems are in placed on DoD facilities. These systems have proven to be problematic and in some cases very inefficient. It is estimated that heat losses from these systems cost the Army over $100 million per year. The FY94 "Redbook" gives annual maintenance costs of about $25 million for the Army alone.

SOLUTION

Low temperature hot water (LTHW) systems have been widely used in Europe for many years and are now gaining acceptance in the United States by the private sector. The low-temperature materials and procedures have reduced the cost of these systems such that a cost advantage may be possible when replacing deteriorated steam and high-temperature water systems. Many of the improved materials and methods used in the low-temperature systems are not suitable for high temperature water or steam systems.

Benefits of the low-temperature systems include lower capital cost, increased efficiency of heat distribution, reduced maintenance due to lower temperature and pressure, and improved materials that can be used only at these lower temperatures. Low temperatures and pressures also result in increased safety for service personnel and building occupants. Heat loss can be reduced from twenty percent or more to under 5% of system capacity. Mass losses due to leakage can be reduced almost to zero, compared to make-up rates of 15% or more for good steam systems. For example, a CRREL study has shown that the Hawthorne AAP steam system has a make-up rate of over 50%.

RESULTS

At Fort Irwin, California, a low-temperature hot water system was installed as part of a new barracks complex. CRREL instrumented this system and monitored its performance over a period of several years. Data collected have shown that the heat losses are about 35% of those from a high temperature water system that was monitored at Fort Jackson.

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